

EPA Region 4 Multi-State Pilot Program Area-Wide Optimization Program

South Carolina Department of Health and Environmental Control

2002 Annual Report

Revised:
July 2003

<http://www.scdhec.net/water/html/awop.html>

The South Carolina Department of Health and Environmental Control (Department) joined the Multi-State Pilot Program and implemented an Area-Wide Optimization Program (AWOP) in 1997. The goal of the Program has been to optimize particulate removal at all surface water treatment plants.

The following report contains a summary of plant data for 2002, a few brief success stories, a review of DHEC optimization activities, and conclusions based on the data. The format of the report follows the AWOP Model; status, evaluation, follow-up, and maintenance components.

Status Component

The 2002 data for all South Carolina surface water treatment plants (60 plants) have been updated. Several plants have shown improvement since the 2001 annual report. The appendix at the end of this report shows summary statistics and charts for all 60 surface water treatment plants.

The Area-Wide Optimization Program in South Carolina is five years old. As shown with the past annual reports, our State continues to show success at our surface water treatment plants. Initially, each participating State was asked to rank the plants and determine which ten had the greatest potential for public health risk. These ten plants were considered priority and optimization efforts were focused on them. Of the original ten priority plants, two have shut down, one has had to rehabilitate the plant and use a new source, and five of them are no longer among the ten worst performing. This year, a new priority list was created using the same scoring system that has been in place for the entire program.

The ten priority (worst performance) plants from 2002 are shown in the table below.

Surface Water Treatment Plant Rankings in 2002

2002 Rank	Raw Average (NTU)	Settled 95th (NTU)	Filtered 95th (NTU)	2002 Score
1	21	5	0.44	701
2	2	2	0.38	574
3	8	2	0.47	570
4	24	2	0.35	535.5
5	6	2	0.32	466
6	4	0.33	0.19	363
7	26	7	0.14	362
8	40	6	0.22	330.5
9	7	2	0.17	312.5
10	5	1	0.16	268

Notes: Plant rankings are out of 60 plants. 1 is worst, 60 is best.

The optimization program is discussed during the annual sanitary survey at each surface water treatment plant. Charts and data are presented and discussed for the time period since the last survey of that water system. In some cases, this annual discussion alone has resulted in plant improvements.

Each year there have been several success stories. Success stories are plants that have significantly improved their performance since the start of the Program. There are many plants that could be discussed, but only the more significant improvements will be discussed in this report.

City of Seneca

The City of Seneca WTP greatly improved their performance between 1999 and 2002. The plant has a regulated capacity of 12 MGD and serves approximately 34,800 people. In 1999, there were no days when the settled water was greater than 1 NTU and there were 52 days when the filtered water turbidity was greater than 0.10 NTU. In 2002, there were again no days when the settled water turbidity was over 1 NTU and only 4 days when the filtered water turbidity was over 0.1 NTU. From 1999 to 2002, the priority ranking score dropped from 142 to 4. The following chart shows their performance over those 3 years and the settled and filtered water turbidities.

City of Seneca

Year	Settled 95th (NTU)	Filtered 95th (NTU)	Score
1999	1	0.13	142
2000	0.95	0.09	14
2001	1.1	0.09	4
2002	0.85	0.08	4

Anderson County Regional Water System

The Anderson County Regional WS improved their performance between 1999 and 2002. The plant has a regulated capacity of 27 MGD and serves approximately 140,000 people. In 1999, there were 91 days when the settled water was greater than 1 NTU and there were 51 days when the filtered water turbidity was greater than 0.10 NTU. In 2002, there were 24 days when the settled water turbidity was over 1 NTU and 0 days when the filtered water turbidity was over 0.1 NTU. From 1999 to 2002, the priority ranking score dropped from 103 to 6. The following chart shows their performance over those 3 years and the settled and filtered water turbidities.

Anderson County Regional WS

Year	Settled 95 th (NTU)	Filtered 95 th (NTU)	Score
1999	2.28	0.16	103
2000	2.08	0.1	50
2001	1.4	0.09	26
2002	1.5	0.07	6

Santee Cooper Regional Water System

The Santee Cooper Regional Water System has shown significant performance improvement between 1999 and 2002. The plant is rated for 36 MGD at a filtration rate of 6 gpm/ft². The average plant production was 13 MGD during 2002. The water system serves approximately 103,000 people. Santee Cooper Regional Water System is also one of the first water systems to participate in the Partnership for Safe Water and continues to be an active member in the program in South Carolina.

In 1999, there were no days when the settled water was greater than 1 NTU and 30 days when the filtered turbidity was greater than 0.1 NTU. In 2002, there was one day when settled turbidity was greater than 1 NTU and there were no days when the filtered turbidity was greater than 0.1 NTU. The following table illustrates the plant performance.

Santee Cooper Regional Water System

Year	Settled 95 th (NTU)	Filtered 95 th (NTU)	Score
1999	0.42	0.14	30
2000	0.43	0.14	27
2001	0.84	0.03	3
2002	0.43	0.05	0

These success stories help to illustrate the overall effectiveness of the Area-Wide Optimization Program in South Carolina. There are many other surface water systems that have made improvements in their performance. Some water systems were already meeting or exceeding the goals of the program and were not mentioned.

Optimization Program Status

Each year there have been more systems that achieve optimized performance. In 2002, there were 20 plants meeting both goals. The table below shows how many plants met the goals each year.

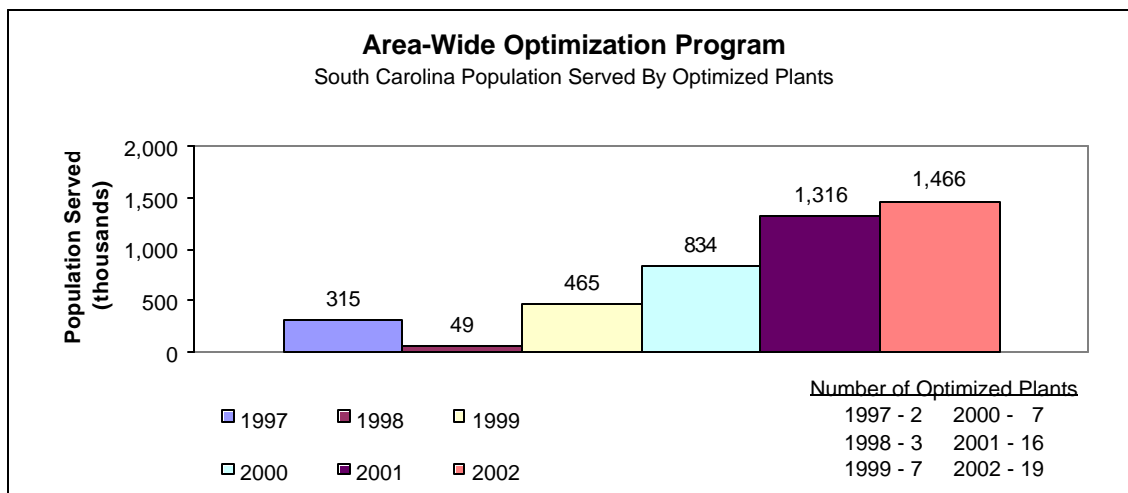
Plants Meeting Performance Goals

Year	# Plants
1999	7
2000	7
2001	16
2002	20

Recently, the US EPA has started focusing attention nationally on the successes achieved by the Region 4 pilot program. One aspect of optimization success that headquarters of EPA has emphasized is the number of people served by plants with optimized performance. This year, for the first time, data was compiled to reflect this emphasis.

2002 SC Population vs. Filtered Water Turbidity Ranges

Filtered Water (NTU)	Number of Plants	Population Served
< 0.10	28	1,665,422
0.11 to 0.20	19	748,474
0.21 to 0.30	5	219,011
0.31 to 0.5	2	7,478
> 0.5	0	0
Total Population Served by SWTP's		2,640,384



The above table and chart shows the breakdown by filtered water turbidity ranges and population served by optimized plants by year. The population served by optimized plants (met settled & filtered goal) was 315 thousand in

1997 and 1.4 million in 2002. The 1.4 million is approximately 53% of the population that is served by surface water.

Settled Water Goal – Of the 60 surface water systems in South Carolina, 40 met the settled water turbidity goal.

Filtered Water Goal – Of the 60 surface water systems in South Carolina, 28 met the filtered water turbidity goal.

Evaluation Component

There are several tools used in the evaluation component of the AWOP Model. Sanitary surveys, even though regulated federally, are an excellent tool for discussing a plant's optimization performance. The CPE is another important evaluation component tool. After the status component is completed each year, staff members can determine which plant or plants would be benefited by having a CPE performed.

In 2002, we decided that the City of Rock Hill's WTP was close to being optimized, but there were some aspects of their performance that could be improved upon. A CPE was performed at the Rock Hill WTP on October 1-3, 2002. This CPE was open to each of the other states and participants came from North Carolina, Georgia, US EPA, and even a contingent from Korea Water Resources Corporation all the way from Thejeon, Korea.

Follow-up Component

Once all of the participating states had developed their status and evaluation components, the group began development of the follow-up component. The major tool used in the follow-up component is performance-based training, or PBT. The training is comprised of several centralized training events with hands on activities followed by facilitation activities. The focus of the training is to transfer optimization skills to plant operators and let them use what they learn to optimize their plants. PBT is implemented at multiple utilities simultaneously in order to foster both partnering and competition between the utilities.

Because of staffing and budget issues, DHEC decided to partner with North Carolina, Georgia, and EPA R4 to implement PBT for the first time in 2001. The training covers fifteen months total. The participating utilities were the City of Dalton, Georgia, Greer CPW in Greer, South Carolina, and the Cherokee Indian Reservation water system in Cherokee, North Carolina. The training was a success for Greer CPW. There are still some settled water issues to work out, but the 95th percentile for filtered water dropped from 0.20 NTU in 2000 before the training began to 0.10 NTU for 2002.

Currently, South Carolina and North Carolina have started a second round of PBT. Chester Metro, Camden, and Rock Hill are all participating from South

Carolina. Also participating is the City of Hendersonville from North Carolina. To date, two of the five quarterly training sessions have been conducted. All four of these plants have had a CPE and the three from South Carolina are in the same watershed.

Maintenance Component

The maintenance component has not yet been fully developed in South Carolina. However, it is anticipated that this component will incorporate AWOP activities into other job activities. Some examples of this are design review, staff training, funding, etc. Currently, optimization standards are applied to proposed new facilities during the permit review process. In addition, when a water plant wants to use high-rate filtration (greater than 4.0 gpm/ft²) they must complete a 12-month study. When the study is completed, data is reviewed with respect to the optimization goals and sometimes high-rate filtration is not approved based on not meeting the optimization goals.

2002 AWOP Activities

1. CPE's attended: Hendersonville, NC, Opelika, AL, & Rock Hill, SC
2. Performance Based Training:
Round 1 – Dalton GA, Greer SC, Cherokee NC
Round 2 – Chester Metro, Camden, Rock Hill
3. Quarterly meetings attended: Columbia, Frankfort, Atlanta
4. AWOP Presentations given:
SC Environmental Conference, Myrtle Beach (2 pres. given)
ASDWA Advanced D.W. Workshop, Atlanta
SC WTP Operators conference, Myrtle Beach
SC-GA AWWA Joint Technology Forum, Hilton Head Island
SC DHEC Annual SWTP meeting
(Attended by R4 & TSC EPA) (3 pres. given)
SC DHEC Board September Board Meeting
State Drinking Water Directors Meeting
5. Publications: Articles written about AWOP in DHEC publication "Newsleak", Performance data given for CDWO website
DHEC AWOP website was posted in 2002
6. Other activities: Filter assessment technical assistance, Jar testing technical assistance, Discussion of AWOP during plant sanitary surveys

Conclusions

South Carolina DHEC drinking water staff remains very active in the Program and continually provides support to current member states and those who have recently joined the Program. The EPA sees the success of this program and is looking for ways to implement similar programs across the country. All staff members and upper management consider the Program a success and look forward to improved results in the future.